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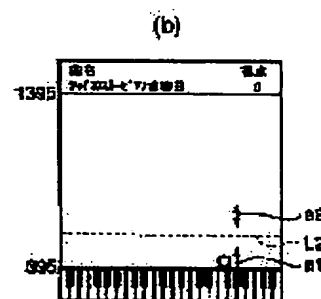
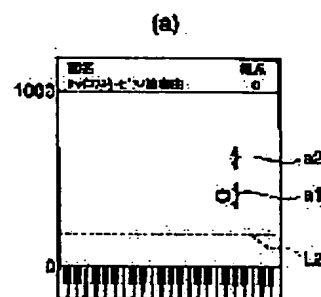
(54) MUSICAL AMUSEMENT SYSTEM

(57)Abstract:

PURPOSE: To provide a musical amusement system which enables even a beginner unable to read a music to easily and pleasantly play an electronic musical instrument.

CONSTITUTION: Respective notes are characterized and are expanded in a transverse direction. These notes are arranged in the positions perpendicularly upper than the keys to be played by the player. The notes depicted as apples are moved by animation scroll from above to below. An arrow is shot and is stuck to the apple when the player touches the key board to be touched by timing the arrival of a range a1 to permit sound production of the apple at the straight line of the 'present playing position' shown by a straight line L2.

The apple stuck with the arrow disappears from the screen. A score is added when the apple disappears. On the other hand, the arrow fails to be stuck to the apple, the apple does not disappear and the display screen is scrolled to the last in case the player misses the timing to play. The score is added as well even if the player releases the touched key when the key is touched and the range a2 to permit silencing of the apple stuck with the arrow just arrives at the straight line L2.



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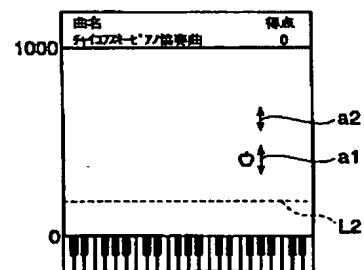
(54)【発明の名称】 音楽的アミューズメントシステム

(57)【要約】

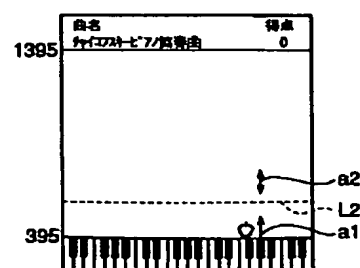
【目的】 楽譜を読めない初心者でも簡単に且つ楽しんで電子楽器を演奏することができる音楽的アミューズメントシステムを提供する。

【構成】 各音符がキャラクタ化されて、横方向に拡げられ、演奏者が弾くべき鍵の垂直上方の位置に音符が配置され、リング化された音符は、画面上、上から下にアニメーションスクロールされて移動され、演奏者が、直線L2で示す「現在の演奏位置」の直線にリングの発音許可範囲a1が差し掛かるタイミングを見計らって、弾くべき鍵盤を押鍵すると、矢が発射されてリングに刺さり、矢の刺さったリングは画面上から消滅する。リングが消滅すると得点が加算される一方、演奏者が弾くべきタイミングをはずすと、矢はリングに刺さらずにリングは消滅せず、表示画面の最後までスクロールされて行く。また、押鍵されて矢の刺さったリングの消音許可範囲a2が直線L2に差し掛かったときに演奏者がその押鍵された鍵を離鍵したときも、得点が加算される。

(a)



(b)



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【特許請求の範囲】

【請求項 1】 演奏データを記憶する演奏データ記憶手段と、

該記憶された演奏データに応じて楽譜情報を縦方向に表示する表示手段と、

該表示された楽譜情報を、前記演奏データに応じたテンポで所定の方向にスクロールするスクロール手段とを有することを特徴とする音楽的アミューズメントシステム。

【請求項 2】 難易度を設定するための難易度設定手段 10 を有し、

前記スクロール手段は、該設定された難易度に応じて前記テンポを変更し、該変更後のテンポでスクロールすることを特徴とする請求項 1 記載の音楽的アミューズメントシステム。

【請求項 3】 演奏者が演奏情報を入力するための演奏情報入力手段と、

前記表示された楽譜情報の各音符毎に、発音許可すべき所定の範囲を付与する許可範囲付与手段と、

前記スクロールされた楽譜情報の音符が該音符に付与された前記発音許可範囲内で、前記演奏情報入力手段から 20 当該音符に対応する音高の演奏情報が入力されたことを検出する検出手段と、

該検出手段により当該音符に対応する音高の演奏情報が前記発音許可範囲内で入力されたことが検出された場合に、所定の制御処理を行う制御処理手段とを有することを特徴とする請求項 1 または 2 のいずれかに記載の音楽的アミューズメントシステム。

【請求項 4】 前記制御処理手段が行う所定の制御処理は、当該音符に応じた発音処理であることを特徴とする 30 請求項 3 記載の音楽的アミューズメントシステム。

【請求項 5】 前記演奏データ記憶手段は、前記表示手段に表示された演奏データ以外の演奏データを記憶し、前記制御処理手段は、任意にまたは前記難易度設定手段により設定された難易度に応じて、前記音符に応じた発音処理と前記表示手段に表示された演奏データ以外の演奏データに応じた発音処理とを選択して行うことを特徴とする請求項 4 記載の音楽的アミューズメントシステム。

【請求項 6】 前記許可範囲付与手段は、前記表示された各音符毎に、消音許可すべき所定の範囲を付与し、前記検出手段は、該付与された消音許可範囲内で前記演奏情報入力手段から当該音符に対応する音高の演奏情報の入力が停止されたことを検出し、前記制御処理手段は、該検出手段により当該音符に対応する音高の演奏情報の入力が前記消音許可範囲内で停止された場合に、所定の制御処理を行うことを特徴とする請求項 3 記載の音楽的アミューズメントシステム。

【請求項 7】 前記許可範囲付与手段は、前記難易度設定手段に応じて発音許可範囲および消音許可範囲のすく 50

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なくとも一方を変更して付与することを特徴とする請求項 6 記載の音楽的アミューズメントシステム。

【請求項 8】 前記制御処理手段が行う所定の制御処理は、当該音符に応じた発音または消音処理であることを特徴とする請求項 7 に記載の音楽的アミューズメントシステム。

【請求項 9】 前記制御処理手段が行う所定の制御処理は、当該音符またはテンポに応じた得点の加算であることを特徴とする請求項 1 乃至 8 のいずれかに記載の音楽的アミューズメントシステム。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、電子楽器の教習用として、またはゲーム機として使用することができる音楽的アミューズメントシステムに関する。

【0002】

【従来の技術】従来、楽譜をディスプレイに表示し、演奏者はその楽譜を見ながら電子楽器を演奏するようにしたシステムは知られている。

【0003】

【発明が解決しようとする課題】しかしながら、上記従来のシステムでは、演奏者が楽譜を読めることを前提にしているために、楽譜を読めない初心者では電子楽器を演奏することができなかった。

【0004】本発明は、上記問題に鑑みてなされたもので、楽譜を読めない初心者でも簡単に且つ楽しんで電子楽器を演奏することができる音楽的アミューズメントシステムを提供することを目的とする。

【0005】

【課題を解決するための手段】上記目的を達成するため本発明は、演奏データを記憶する演奏データ記憶手段と、該記憶された演奏データに応じて楽譜情報を縦方向に表示する表示手段と、該表示された楽譜情報を、前記演奏データに応じたテンポで所定の方向にスクロールするスクロール手段とを有することを特徴とする。

【0006】好ましくは、難易度を設定するための難易度設定手段を有し、前記スクロール手段は、該設定された難易度に応じて前記テンポを変更し、該変更後のテンポでスクロールすることを特徴とする。

【0007】また、好ましくは、演奏者が演奏情報を入力するための演奏情報入力手段と、前記表示された楽譜情報の各音符毎に、発音許可すべき所定の範囲を付与する許可範囲付与手段と、前記スクロールされた楽譜情報の音符が該音符に付与された前記発音許可範囲内で、前記演奏情報入力手段から当該音符に対応する音高の演奏情報が入力されたことを検出する検出手段と、該検出手段により当該音符に対応する音高の演奏情報が前記発音許可範囲内で入力されたことが検出された場合に、所定の制御処理を行う制御処理手段とを有することを特徴とする。

【0008】さらに、好ましくは、前記制御処理手段が行う所定の制御処理は、当該音符に応じた発音処理であることを特徴とし、また、前記演奏データ記憶手段は、前記表示手段に表示された演奏データ以外の演奏データを記憶し、前記制御処理手段は、任意にまたは前記難易度設定手段により設定された難易度に応じて、前記音符に応じた発音処理と前記表示手段に表示された演奏データ以外の演奏データに応じた発音処理とを選択して行うことを特徴とする。

【0009】また、前記許可範囲付与手段は、前記表示された各音符毎に、消音許可すべき所定の範囲を付与し、前記検出手段は、該付与された消音許可範囲内で前記演奏情報入力手段から当該音符に対応する音高の演奏情報の入力停止されたことを検出し、前記制御処理手段は、該検出手段により当該音符に対応する音高の演奏情報の入力前記消音許可範囲内で停止された場合に、所定の制御処理を行うことを特徴とする。

【0010】好ましくは、前記許可範囲付与手段は、前記難易度設定手段に応じて発音許可範囲および消音許可範囲のすくなくとも一方を変更して付与することを特徴とし、前記制御処理手段が行う所定の制御処理は、当該音符に応じた発音または消音処理であることを特徴とする。

【0011】さらに、好ましくは、前記制御処理手段が行う所定の制御処理は、当該音符またはテンポに応じた得点の加算であることを特徴とする。

【0012】

【作用】本発明の構成に依れば、演奏データ記憶手段に記憶された演奏データに応じて楽譜情報が縦方向に表示され、その表示された楽譜情報が前記演奏データに応じたテンポで所定の方向にスクロールされる。

【0013】また、演奏情報が、スクロールされた楽譜情報の音符に付与された発音許可範囲内で入力されたことが検出されると、制御処理手段により所定の制御処理が行われる。

【0014】

【実施例】以下、本発明の実施例を図面に基づいて詳細に説明する。

【0015】図1は、本発明の一実施例に係る音楽的アミューズメントシステムの概略構成を示すブロック図である。

【0016】同図において、本実施例の音楽的アミューズメントシステムは、音高情報を入力するための鍵盤1と、各種情報を入力するためのパネル操作子2と、システム全体の制御を司るCPU3と、該CPU3が実行する制御プログラムや画像情報等を格納するROM4と、演奏中の演奏データやCPU3が実行する演算結果等を一時的に記憶するRAM5と、複数の演奏データを記憶する、例えばメモリカードやROMカートリッジ等の外部記憶装置6と、演奏情報や各種情報を表示するディス

プレイ7と、外部からのMIDI (Musical Instrument Digital Interface) 信号を入力したり、MIDI信号として外部に出力したりするためのMIDIインターフェース(I/F)8と、鍵盤1から入力された音高情報等の各種楽音を楽音信号に変換する音源9と、該音源9からの楽音信号を音響に変換する、例えばスピーカ等のサウンドシステム10とにより構成されている。そして、上記構成要素2〜9は、アドレス・データバス11を介して相互に接続され、音源9にはサウンドシステム10が接続されている。

【0017】図2は、本実施例の音楽的アミューズメントシステムが行う動作の概要を説明するための図である。図中、(a)は、通常の楽譜を示し、(b)は、(a)の楽譜を時計方向に90°回転した楽譜を示し、(c)は、(b)の楽譜を直線L1を中心にして折り返した楽譜を示している。そして、本実施例の音楽的アミューズメントシステムは、(c)の楽譜に基づいて動作する。すなわち、曲の進行(テンポ)に従って(c)の楽譜(すなわち各音符)が図のスクロール方向にスクロールされ、演奏者は、楽譜の各音符が所定の位置に到達した時点で、当該音符に対応する鍵盤1を押鍵して、曲を演奏する。

【0018】なお、(b)の楽譜に基づいて本実施例の音楽的アミューズメントシステムを動作させることもできるが、スクロール方向が垂直上方向であるために、演奏者が鍵盤1を押鍵するタイミングを取り難いことから、本実施例では(c)の楽譜に基づいて動作させるようにしている。

【0019】図3は、本実施例の音楽的アミューズメントシステムのディスプレイ7に実際に表示される表示画面の一例を示す図である。

【0020】同図に示すように、ディスプレイ7には、図2(c)の各音符がリングの形状で表示されるとともに、演奏者がどの鍵を弾けばよいのか分かるように鍵盤も表示されている。すなわち、図2(c)の各音符がキャラクタ化されて、横方向に並び、演奏者が弾くべき鍵の垂直上方の位置に各音符が配置される。

【0021】そして、リング化された音符は、画面上、上から下にアニメーションスクロールされて移動して行く。演奏者は、直線L2で示す「現在の演奏位置」の直線にリングが差し掛かるタイミングを見計らって、弾くべき鍵盤1を押鍵すると、矢が発射されてリングに刺さり、矢の刺さったリングは画面上から消滅する。リングが消滅すると得点が加算される一方、演奏者が弾くべきタイミングをはずすと、矢はリングに刺さらずにリングは消滅せず、表示画面の最後までスクロールされて行く。同様に、タイミングを見計らって押鍵している鍵を離鍵すると、得点が加算される。

【0022】この処理は、後述するようにCPU3によってなされるので、曲本来のタイミングで鍵盤1を弾い

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たときのみ、すなわちCPU3が処理できる最小時間で正確に弾いたときのみ、リングに矢が刺さるようにすると、上級者でもリングに矢が刺さらないこととなる。このため、押鍵タイミングの範囲を発音許可範囲a1とし、離鍵タイミングの範囲を消音許可範囲a2として、鍵盤1を弾くタイミングにある程度余裕を持たせている。したがって、この範囲a1、a2が直線L2に差し掛かっているときに、演奏者は対応する鍵盤1を押鍵すればよい。

【0023】なお、リングに矢が刺さったときに、その音符の音を鳴らすようにしてもよいし、鳴らさないようにしてもよい。また、演奏者のレベルに応じて音を鳴らすか否かを切り換えてもよい。音を鳴らさないようにした場合には、演奏する曲と無関係な曲をBGMとして流すようにしてもよい。例えば、クラシックのピアノ曲の譜面に基いてアニメーションスクロールが行われている場合に、BGMはロックミュージックでもよい。ただし、テンポは、アニメーションスクロールを行っている曲と一致させた方がよい。テンポによってスクロール速度が変わり、シューティングゲームとしての演奏の難しさが変わるため、BGMもテンポによって変更する方が望ましいからである。

【0024】さらに、本実施例では、音符をリングに変形したことにより音符の音長が不明になっているので、演奏者が音長を分かるように音長に応じて、例えばリングの色が異なるようにすればよい。

【0025】また、本実施例では、キャラクタをリングにしたが、これに限る必要はなく、例えば飛行機や鳥等であってもよく、この場合には機銃やライフル銃で撃ち落とすようにすればよい。

【0026】以上のように構成された音楽的アミューズメントシステムが実行する制御処理を、以下、図4～6を参照して説明する。

【0027】図4は、本実施例の音楽的アミューズメントシステムのCPU3が実行するメインルーチンの手順を示すフローチャートである。

【0028】同図において、まず、RAM5のクリアや各種ポートのクリア等の初期設定を行う（ステップS1）。

【0029】次に、前記RAM5に確保された演奏データ記憶領域から画面表示分の音符情報を読み出し、その読み出した音符情報に音符が含まれている場合には各音符毎に発音許可範囲、消音許可範囲を決定し、RAM5の所定領域に記憶し（ステップS2）、音符を前記リングの形状でディスプレイ7に表示する（ステップS3）。ここで、演奏データ記憶領域に記憶される音符情報は、例えば音高および該音符の種類等を示すイベントデータと、該イベントデータ間の時間間隔を示すデュレーションデータとにより構成され、音符情報の最後には演奏データの最後を示すエンドデータが記憶されてい

る。

【0030】図6は、ディスプレイ7に表示された画面の一例を示す図であり、(a)は、曲の演奏をスタートする前の画面を示し、(b)は、曲を演奏しているときの画面を示している。図中、数字は、演奏データ記憶領域におけるデータの位置を示し、各図において、上の数字（“1000”，“1395”）は、画面表示分の音符情報の上限位置を示し、下の数字（“0”，“395”）は、その下限位置を示している。また、直線L2は、前記図3で説明した「現在の演奏位置」である。以下、この図6を参照して、各ステップS2、S3の処理を具体的に説明する。

【0031】前記余裕範囲として範囲“30”を採ると（この範囲は音符の種類に応じて変更した方が望ましい）、ステップS2で読み出されたイベントデータおよびデュレーションデータから、例えば、発音許可範囲a1は、390～420の範囲と決定され、消音許可範囲a2は、590～620の範囲と決定され、音高は“C6”と決定され、これらの各情報は、RAM5に確保された所定領域に記憶される。そして、これらの情報に基づいて、(a)の画面がディスプレイ7に表示される。

【0032】図4に戻り、曲の演奏をスタートする指示がなされたか否かを判別する（ステップS4）。ここで、曲の演奏をスタートさせる指示は、例えばパネル操作子2の図示しないスタートスイッチを押下することによって行うようにすればよい。

【0033】ステップS4の判別で、スタートの指示がなされたときにはステップS5に進み、一方、スタートの指示がなされないときにはスタートの指示があるまで待機する。

【0034】ステップS5では、後述する図5のタイマ割り込み処理が実行されるようにタイマ割り込みを許可し、ステップS6では、演奏者が鍵盤1を押鍵することによって発生する押鍵イベントがあったか否かを判別する。

【0035】ステップS6の判別で、押鍵イベントがあったときには、その押鍵イベントの発生タイミングが前記ステップS2で決定した発音許可範囲内に入り、且つ音高が一致しているか否かを判別する（ステップS7）。この判別は、前記ステップS2でRAM5に記憶した発音許可範囲および音高に基づいて行うようにする。

【0036】ステップS7の判別で、その答えが“YES”のときには、当該押鍵イベントの発音処理を行い（ステップS8）、前述したように矢を対応するリングに刺すとともに、矢が刺さったリングの得点を計算し、それまでの得点に加算して表示する（ステップS9）。

【0037】一方、ステップS6の判別で押鍵イベントがないときには、ステップS7～S9をスキップしてステップS10に進み、ステップS7の判別でその答えが

“NO”のときには、ステップS8～S9をスキップしてステップS10に進む。

【0038】ステップS10では、演奏者が鍵盤1を離鍵することによって発生する離鍵イベントがあったか否かを判別し、離鍵イベントがあったときには、前記ステップS7と同様にして、その離鍵イベントの発生タイミングが前記ステップS2で決定し、記憶した消音許可範囲内に入り、且つ音高が一致しているか否かを判別する（ステップS11）。

【0039】ステップS11の判別で、その答えが“YES”のときには、当該離鍵イベントの消音処理を行い（ステップS12）、前記ステップS9と同様にして、得点を計算し、それまでの得点に加算して表示する（ステップS13）。

【0040】一方、ステップS10の判別で離鍵イベントがないときには、ステップS11～S13をスキップしてステップS14に進み、ステップS11の判別でその答えが“NO”のときには、ステップS12、S13をスキップしてステップS14に進む。

【0041】ステップS14では、消音範囲を過ぎて発音中の音を消音し、ステップS15では、曲の演奏をストップさせる指示がなされたか否かを判別する。ここで、ストップの指示は、演奏者がパネル設定操作子2の図示しないストップスイッチを押下することによって行うようにすればよい。

【0042】ステップS15の判別で、ストップの指示がなされないときには前記ステップS6に戻って上述の処理を繰り返し、一方、ストップの指示がなされたときには終了処理を行った（ステップS16）後に、前記ステップS2に戻って上述の処理を繰り返す。

【0043】図5は、タイマ割り込み処理の手順を示すフローチャートであり、本割り込み処理は、例えば所定の音符の長さに応じた時間毎に1回の割合でなされている。すなわち、テンポに応じて割り込みタイミングを変更するようにしている。なお、割り込みは、これに限らず、所定時間（例えば、10msec）毎のタイミングで発生するようにしてもよい。

【0044】同図において、まず、現在位置をインクリメントする（ステップS21）。ここで、現在位置とは、前記図6の直線L2で示す位置をいい、ステップS21では、この位置を“1”だけインクリメントする。

【0045】次に、読み出し位置をインクリメントする（ステップS22）。ここで、読み出し位置とは、前記図6で説明した画面表示分の音符情報の上限位置をいい、ステップS22では、この位置を“1”だけインクリメントする。

【0046】ステップS21、S22でインクリメントした位置に基づいて、ディスプレイ7の画面表示を書き換えて、前述したアニメーションスクロールを行うスクロール処理を行い（ステップS23）、前記RAM5の

所定領域に確保され、前記読み出したデュレーションデータを格納するソフトカウンタTIME（以下、デュレーションタイムTIME）という）を“1”だけ減算する（ステップS24）。

【0047】次に、このデュレーションタイムTIMEが“0”であるか否かを判別し（ステップS25）、デュレーションタイムTIME≠0のときには本割り込み処理を終了し、一方、デュレーションタイムTIME=0のときには音符情報を読み出す（ステップS26）。

【0048】そして、この読み出された音符情報が、「音符（すなわち、前述したイベントデータ）」であるか否かを判別し（ステップS27）、「音符」であるときにはディスプレイ7にリング化して表示し（ステップS28）、前記図4のステップS2と同様に、読み出し位置と音符種類を基に、発音許可範囲と消音許可範囲を決定し、RAM5の所定領域に記憶し（ステップS29）、読み出しアドレスを“1”だけ進めた（ステップS30）後に、前記ステップS26に戻って音符情報の読み出しを繰り返す。

【0049】一方、ステップS27の判別で、読み出した音符情報が「音符」でないときには、その情報が「デュレーションデータ」であるか否かを判別し（ステップS31）、デュレーションデータであるときには、その値を前記デュレーションタイムTIMEに記憶した（ステップS32）後に、本タイマ割り込み処理を終了する。

【0050】一方、ステップS31の判別で、読み出した音符情報がデュレーションデータでないときには、そのデータが「エンドデータ」であるか否かを判別する（ステップS33）。

【0051】ステップS33の判別で、読み出したデータがエンドデータでないときには、直ちに本割り込み処理を終了し、一方、読み出したデータが塩素データであるときには、終了処理を行った（ステップS34）後に、本割り込み処理を終了する。

【0052】以上説明したように本実施例では、音符情報を読み出して、アニメーションスクロールし、音符に対応するキャラクタが発音許可範囲内に来たときに鍵盤1を押鍵するとそのキャラクタが撃ち落とされて得点が加算されるとともに当該楽音が発音され、消音許可範囲内に来たときに押鍵されている鍵を離鍵すると、得点が加算されるとともに当該楽音が消音されるように構成したので、楽譜を読むことのできない初心者でも、簡単に且つ楽しんで電子楽器を演奏することができる。また、ディスプレイ7に鍵盤を表示するとともに、押鍵すべき鍵の位置でキャラクタがスクロールするようにしたので、演奏者は感覚的にどの鍵盤を弾けばよいかが分かる。さらに、演奏する曲が難曲である場合には、シューティングゲームとして難しくなるために、電子楽器に興味のあるユーザのみならず、ゲームマニアにもユーザの

幅を拡大することができる。

【0053】なお、本実施例では、電子楽器として電子鍵盤楽器を用いて説明したが、これに限る必要はない。

【0054】また、本実施例では、音楽的アミューズメントシステムとして、図1のように、本発明を実施する構成要素を全て含んだ一体型に構成したが、これに限らず、構成要素を別体で構成してもよい。例えば、図7に示すように、演奏曲に従ってMIDI信号を出力する電子楽器21と、該出力されたMIDI信号を入力し、前記図4および5で説明した処理に応じて、図6のようにディスプレイに表示したり、発音/消音を指示するMIDI信号を出力したりするパーソナルコンピュータ22と、該出力されたMIDI信号を入力し、実際に楽音の発音/消音を行う音源23およびサウンドシステム24とにより音楽的アミューズメントシステムを構成するようにしてもよい。

【0055】さらに、本実施例では、前記図2(c)に示すように、画面上を上から下へスクロールするようにしたが、これに限らず、図8に示すように、遠近感を持たせて、音符(キャラクタ)がだんだん近づいて来るようにしてもよい。

【0056】なお、本実施例では、図5を用いて前述したように、テンポに応じた割込周期で割り込み処理を行っているため、演奏する曲が演奏者にとって難し過ぎる場合には、テンポを遅く設定するようにするとよい。テンポを遅くすると、ゲームとしては当然、簡単になるので、得点を加算するときのウェイトをテンポに応じて変更する必要がある。このようにすることで、演奏者は、どんな難曲もテンポを遅くすることにより弾くことができる。しかしながら、正規のテンポよりはるかに遅い演奏では、たとえ最後まで弾けたとしても、「弾けた気分」を味わうことができないので、このようなときには、前述したように演奏曲に無関係なBGMを流すとよい。そして、だんだん弾けるようになるに従って、テンポを上げていき、正規のテンポになったときに、発音・消音処理を行うようにすると、そのレベルでは、ある程度弾けるようになっているはずであるので、「弾けている」という実感を得ることができる。また、演奏曲が他の楽器の演奏をもつ、例えばピアノ協奏曲等の場合には、発音・消音処理とともに、オーケストラの演奏を付加するとさらに臨場感がよくなる。

【0057】また、発音許可範囲および消音許可範囲にそれぞれレベルを設け、イベントが正規のタイミングにより近いときには、得点をより多く加算するようにしてもよい。

【0058】図9は、上述のテンポに応じて得点等を変更するようにした機能を付加した場合に、本実施例の音楽的アミューズメントシステムが実行する制御処理の手順を示すフローチャートである。

【0059】同図において、まず、操作者の指示により

または自動的に、難易度またはテンポを選択する(ステップS41)。ここで、「難易度またはテンポ」としたのは、難易度とテンポとは通常同様の関係、すなわち、難易度が上がればテンポが速くなり、難易度が下がればテンポが遅くなるという関係を有するので、難易度を指定することにより曲のテンポを変更するようにしてもよいし、直接曲のテンポを変更するようにしてもよいことを示すためである。また、「難易度」とは、ゲームなどの「面」や「ステージ」に対応するものであり、この難易度によってテンポや前記発音許可範囲および消音許可範囲が変化する。

【0060】次に、演奏曲の演奏を開始し(ステップS42)、難易度(テンポ)に応じて発音制御、BGM再生または伴奏再生のうちいずれかを選択して行い(ステップS43)、難易度(テンポ)に応じた得点の加算を行った(ステップS44)後に、演奏曲の演奏を終了する(ステップS45)。ここで、ステップS42~S45の処理は、具体的には、前記図4の処理と同様の処理により実現される。なお、ステップS43の選択は、演奏者がマニュアル操作により選択するようにしてもよい。

【0061】次に、獲得した得点とその難易度での合格ラインおよび不合格ラインとを比較する得点判断を行い(ステップS46)、この判断結果に応じて次のステージでの難易度(テンポ)を変更し(ステップS47)、所定の得点以上か否かを判別する(ステップS48)。

【0062】ステップS48の判別で、獲得した得点が所定得点以上のとき、すなわち曲が演奏できたときには本制御処理を終了する一方、獲得した得点が所定得点より少ないときには前記ステップS42に戻って前述の処理を繰り返す。したがって、本制御処理を終了できたときには、テンポは正規のテンポになっているはずである。逆にいうと、正規のテンポで演奏できないうちは、所定得点以上にならないように獲得すべき点数を決めておけばよい。

【0063】このように本機能を付加することで、難易度に応じて最適な曲の練習(またはゲーム)を行うことができ、継続して練習をする場合に、演奏者を飽きさせないようにすることができる。

【0064】

【発明の効果】以上説明したように、本発明に依れば、演奏データ記憶手段に記憶された演奏データに応じて楽譜情報が縦方向に表示され、その表示された楽譜情報が前記演奏データに応じたテンポで所定の方向にスクロールされるので、楽譜を読めない初心者でも簡単に且つ楽しんで電子楽器を演奏することが可能となる効果を奏する。

【0065】また、演奏情報が、スクロールされた楽譜情報の音符に付与された発音許可範囲内で入力されたことが検出されると、制御処理手段により所定の制御処理

が行われるので、演奏者は感覚的にどのように演奏情報を入力すればよいかが分かるとともに、ゲームとして楽しむこともできる。

【図面の簡単な説明】

【図 1】 本発明の一実施例に係る音楽的アミューズメントシステムの概略構成を示すブロック図である。

【図 2】 図 1 の音楽的アミューズメントシステムが行う動作の概要を説明するための図である。

【図 3】 図 1 のディスプレイに実際に表示される表示画面の一例を示す図である。

【図 4】 図 1 の音楽的アミューズメントシステムの CPU が実行するメインルーチンの手順を示すフローチャートである。

【図 5】 図 1 の音楽的アミューズメントシステムの CPU が実行するタイマ割り込み処理の手順を示すフローチャートである。

【図 6】 図 1 のディスプレイに表示された画面の一例を*

* 示す図である。

【図 7】 他の別の音楽的アミューズメントシステムの概略構成を示すブロック図である。

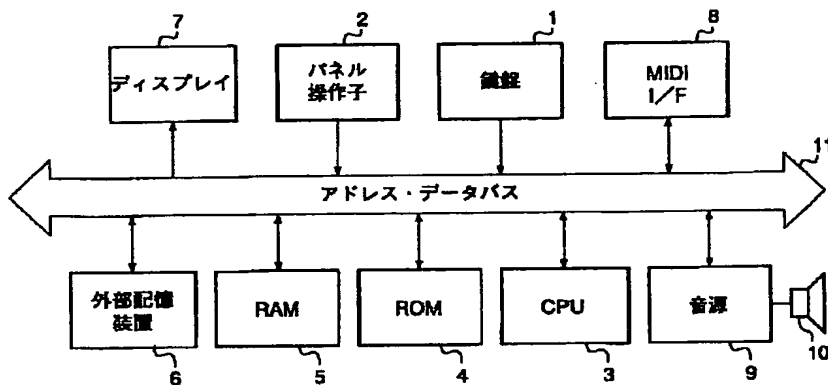
【図 8】 他のアニメーションスクロールの方法を説明するための図である。

【図 9】 本実施例の音楽的アミューズメントシステムにテンポに応じて得点等を変更するようにした機能を付加した場合に、図 1 の CPU が実行する制御処理の手順を示すフローチャートである。

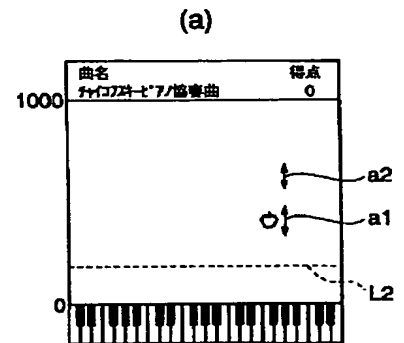
10 【符号の説明】

- 1 鍵盤（演奏情報入力手段）
- 2 パネル操作子（難易度設定手段）
- 5 RAM（演奏データ記憶手段）
- 7 ディスプレイ（表示手段）
- 3 CPU（表示手段、スクロール手段、難易度設定手段、許可範囲付与手段、検出手段、制御処理手段）
- 9 音源（制御処理手段）

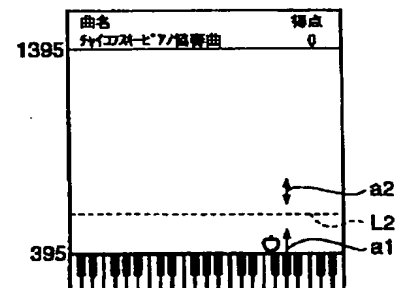
【図 1】



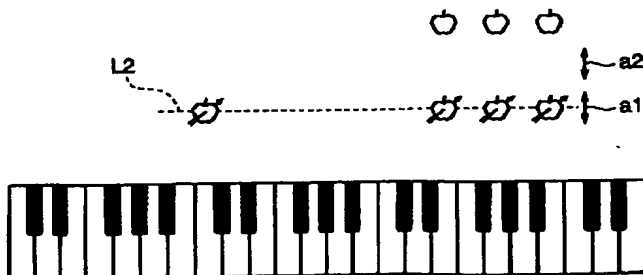
【図 6】



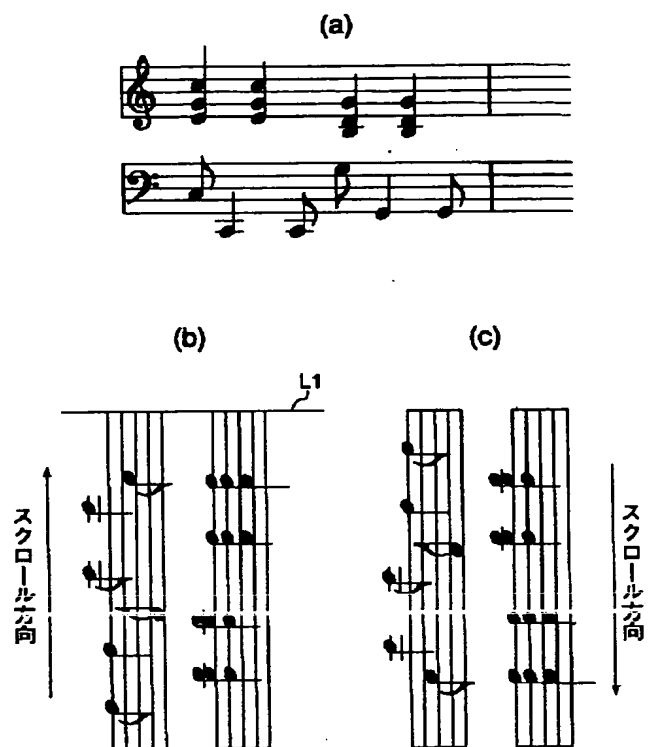
(b)



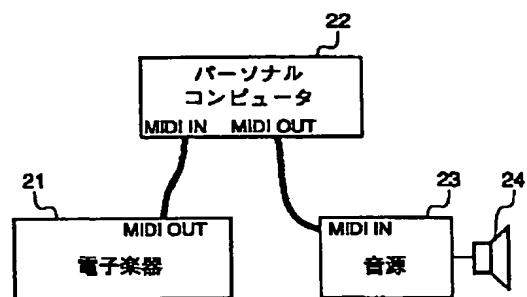
【図 3】



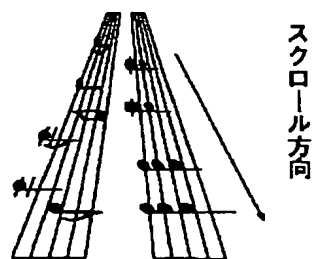
【図2】



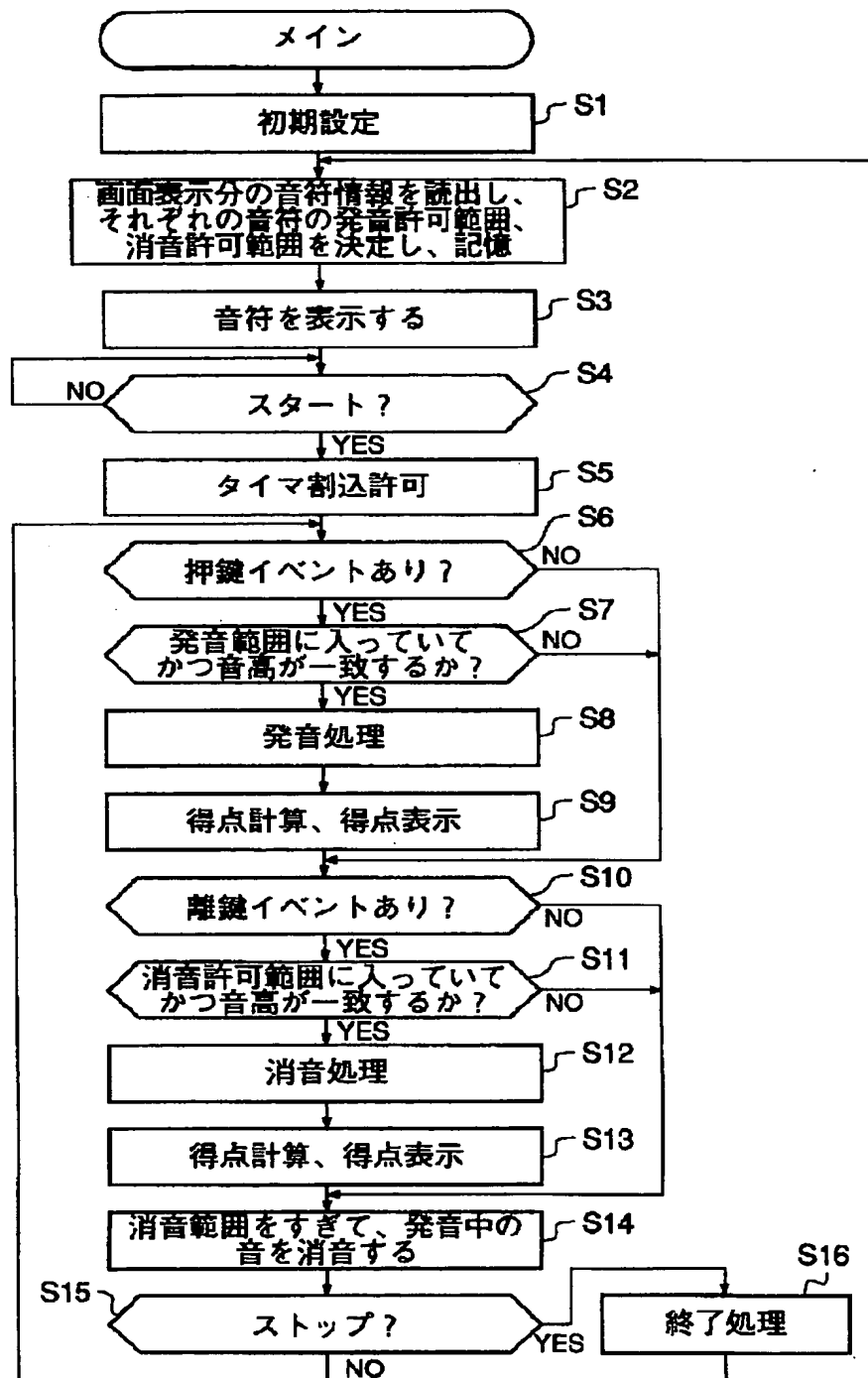
【図7】



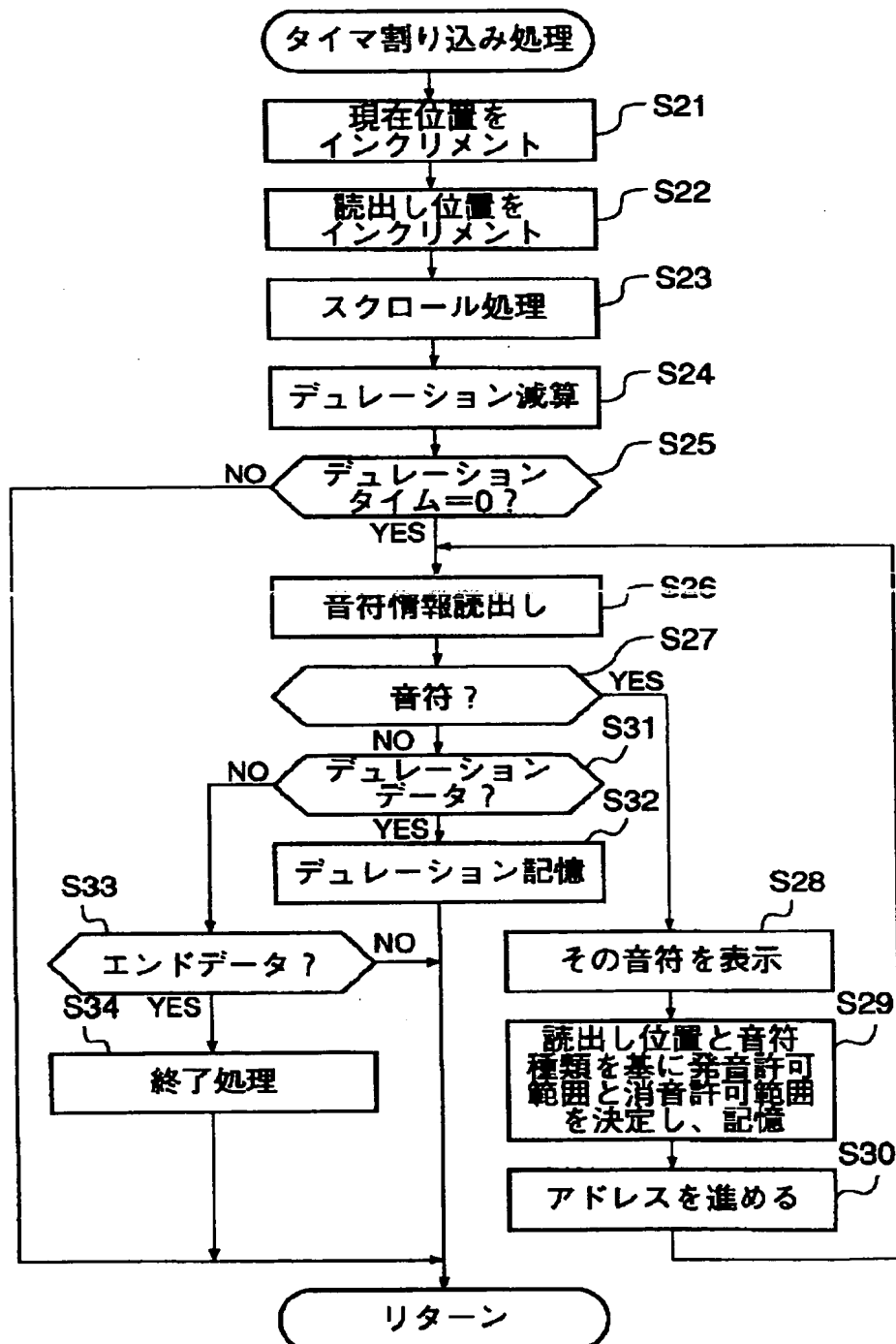
【図8】



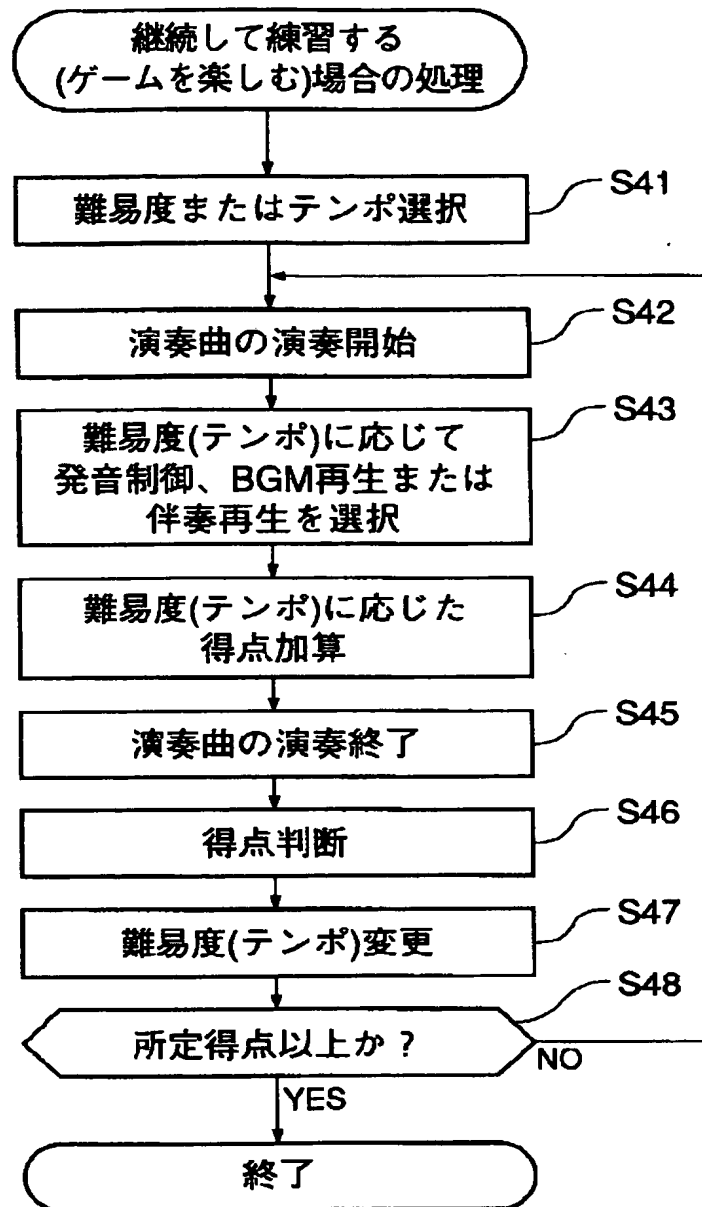
【図4】



【図5】



【図9】



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CLAIMS

[Claim(s)]

[Claim 1] The musical amusement system characterized by having a performance data storage means to memorize performance data, a display means to display score information on a lengthwise direction according to the this memorized performance data, and a scrolling means to scroll the this displayed score information in the direction predetermined by Il Tempo according to said performance data.

[Claim 2] It is the musical amusement system according to claim 1 characterized by having a difficulty setting means for setting up difficulty, and for said scrolling means changing said Il Tempo according to the this set-up difficulty, and scrolling by Il Tempo after this modification.

[Claim 3] A performance information input means for a player to input performance information and an authorization range grant means to give the predetermined range which should carry out pronunciation authorization for every note of said displayed score information, It is said pronunciation authorization within the limits by which the note of said scrolled score information was given to this note. A detection means to detect that the performance information on the pitch corresponding to the note concerned was inputted from said performance information input means, A musical amusement system given in either of claims 1 or 2 characterized by having a control processing means to perform predetermined control processing when the performance information on the pitch corresponding to the note concerned being said pronunciation authorization within the limits, and having been inputted by this detection means is detected.

[Claim 4] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 3 characterized by being pronunciation processing according to the note concerned.

[Claim 5] It is the musical amusement system according to claim 4 carry out said performance data-storage means memorizing performance data other than the performance data displayed on said display means, and carrying out by said control processing means choosing the pronunciation processing according to performance data other than the performance data displayed on the pronunciation processing according to said note, and said display means according to the difficulty arbitrarily set up by said difficulty setting means as the description.

[Claim 6] Said authorization range grant means gives said displayed predetermined range which should carry out silence authorization for every note. Said detection means It is given silence this authorization within the limits, and detects that the input of the performance information on the pitch corresponding to the note concerned was suspended from said performance information input means. Said control processing means The musical amusement system according to claim 3 characterized by performing predetermined control processing when the input of the performance information on the pitch corresponding to the note concerned is said silence authorization within the limits and is suspended by this detection means.

[Claim 7] Said authorization range grant means is a musical amusement system according to claim 6 characterized by changing and giving either [at least] the pronunciation authorization range or the silence authorization range according to said difficulty setting means.

[Claim 8] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 7 characterized by being the pronunciation according to the note concerned, or silence processing.

[Claim 9] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 1 to 8 characterized by being addition of the score according to a note or Il Tempo concerned.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the musical amusement system which can be used as the object for training of electrohone, or a game machine.

[0002]

[Description of the Prior Art] Conventionally, a score is displayed on a display, and while a player looks at the score, the system which played electrohone is known.

[0003]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional system, since it was premised on the ability of a player to read a score, the beginner who cannot read a score was not able to play electrohone.

[0004] This invention was not made in view of the above-mentioned problem, and aims at offering the musical amusement system by which the beginner who cannot read a score can also enjoy himself easily, and can play electrohone.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention is characterized by having a performance data storage means to memorize performance data, a display means to display score information on a lengthwise direction according to the this memorized performance data, and a scrolling means to scroll the this displayed score information in the direction predetermined by Il Tempo according to said performance data.

[0006] It has a difficulty setting means for setting up difficulty preferably, said scrolling means changes said Il Tempo according to the this set-up difficulty, and it is characterized by scrolling by Il Tempo after this modification.

[0007] Moreover, a performance information input means for a player to input performance information preferably, It is said pronunciation authorization within the limits by which an authorization range grant means to give the predetermined range which should carry out pronunciation authorization for every note of said displayed score information, and said scrolled note of score information were given to this note. A detection means to detect that the performance information on the pitch corresponding to the note concerned was inputted from said performance information input means, When the performance information on the pitch corresponding to the note concerned being said pronunciation authorization within the limits, and having been inputted by this detection means is detected, it is characterized by having a control processing means to perform predetermined control processing.

[0008] Furthermore, the predetermined control processing which said control processing means performs preferably It is characterized by being pronunciation processing according to the note concerned. Moreover, said performance data storage means Performance data other than the performance data displayed on said display means are memorized. Said control processing means It is characterized by choosing the pronunciation processing according to performance data other than the performance data displayed on the pronunciation processing according to said note, and said display means, and performing it according to the difficulty arbitrarily set up by said difficulty setting means.

[0009] Said authorization range grant means gives said displayed predetermined range which should

carry out silence authorization for every note. Moreover, said detection means It is given silence this authorization within the limits, and detects that the input of the performance information on the pitch corresponding to the note concerned was suspended from said performance information input means. Said control processing means When the input of the performance information on the pitch corresponding to the note concerned is said silence authorization within the limits and is suspended by this detection means, it is characterized by performing predetermined control processing.

[0010] It is preferably characterized by said authorization range grant means changing and giving either [at least] the pronunciation authorization range or the silence authorization range according to said difficulty setting means, and carries out that the predetermined control processing which said control processing means performs is the pronunciation according to the note concerned, or silence processing as the description.

[0011] Furthermore, predetermined control processing which said control processing means performs is preferably characterized by being addition of the score according to a note or Il Tempo concerned.

[0012]

[Function] If it depends on the configuration of this invention, according to the performance data memorized by the performance data storage means, score information will be displayed on a lengthwise direction, and the displayed score information will be scrolled in the direction predetermined by Il Tempo according to said performance data.

[0013] Moreover, detection of performance information being pronunciation authorization within the limits given to the note of the scrolled score information, and having been inputted performs predetermined control processing with a control processing means.

[0014]

[Example] Hereafter, the example of this invention is explained to a detail based on a drawing.

[0015] Drawing 1 is the block diagram showing the outline configuration of the musical amusement system concerning one example of this invention.

[0016] In this drawing the musical amusement system of this example The panel handler 2 for inputting various information as the keyboard 1 for inputting pitch information, CPU3 which manages system-wide control, and ROM4 which stores the control program which this CPU3 performs, image information, etc., RAM5 which memorizes temporarily the result of an operation which performance data and CPU3 under performance perform, The external storage 6 which memorizes two or more performance data, such as a memory card and a ROM cartridge, Input the MIDI (Musical Instrument Digital Interface) signal from the outside as the display 7 which displays performance information and various information, or MIDI interface 8 for outputting outside as a MIDI signal (I/F), The musical-sound signal from the sound source 9 which changes into a musical-sound signal various musical sound, such as pitch information inputted from the keyboard 1, and this sound source 9 is changed into sound, for example, it is constituted by the sound systems 10, such as a loudspeaker. And the above-mentioned components 2-9 are mutually connected through the address data bus 11, and the sound system 10 is connected to the sound source 9.

[0017] Drawing 2 is drawing for explaining the outline of the actuation which the musical amusement system of this example performs. Among drawing, (a) shows the usual score, (b) shows the score which rotated 90 degrees of scores of (a) clockwise, and (c) shows the score which turned up the score of (b) focusing on the straight line L1. And the musical amusement system of this example operates based on the score of (c). That is, according to advance (Il Tempo) of music, the score (namely, each note) of (c) is scrolled in the scrolling direction of drawing, and when each note of a score reaches a position, a player does key pushing of the keyboard 1 corresponding to the note concerned, and performs music.

[0018] In addition, since the scrolling direction is perpendicular above and a player cannot take easily the timing which carries out key pushing of the keyboard 1, he is trying to make it operate based on the score of (c) in this example, although the musical amusement system of this example can also be operated based on the score of (b).

[0019] Drawing 3 is drawing showing an example of the display screen actually displayed on the display 7 of the musical amusement system of this example.

[0020] As shown in this drawing, while each note of drawing 2 (c) is displayed in the configuration

of an apple, the keyboard is also displayed that a player understands which key should be flipped on the display 7. That is, each note of drawing 2 (c) is character-ized, it can extend in a longitudinal direction, and each note is arranged in the perpendicular upper location of the key which a player should flip.

[0021] And from on a screen top, downward, animation scrolling is carried out and the apple-ized note moves. The timing to which an apple comes to the straight line of "the current performance location" which a player shows in a straight line L2 is chosen at its own discretion, and if key pushing of the keyboard 1 which should be flipped is carried out, the apple with which the arrow was discharged, it was stuck in the apple, and the arrow was stuck will disappear from a screen. If the timing which a player should flip is removed while a score will be added, if an apple disappears, without sticking an arrow in an apple, it will not disappear, but it will be scrolled to the last of the display screen, and an apple will go. A score will be added if similarly key-release of the key which is choosing at its own discretion and carrying out key pushing of the timing is carried out.

[0022] if it is made for an arrow to be stuck in an apple since this processing is made by CPU3 so that it may mention later only when a keyboard 1 is flipped to the timing of music original (i.e., only when it flips correctly by the minimum time amount which can process CPU3), an arrow will not be stuck in an apple by the upper person, either -- things -- ** For this reason, the range of key pushing timing is made into the pronunciation authorization range a1, and allowances are given to some extent to the timing which flips a keyboard 1 by making the range of key-release timing into the silence authorization range a2. Therefore, while these range a1 and a2 is coming to the straight line L2, a player should just do key pushing of the keyboard 1.

[0023] In addition, when an arrow is stuck in an apple, you may make it sound the sound of the note, and may make it not sound. Moreover, you may switch whether a sound is sounded according to a player's level. When it is made not to sound a sound, you may make it pass music unrelated to the music to perform as BGM. For example, when animation scrolling is performed based on the musical score of classic piano music, rock music is sufficient as BGM. Made it however, better for Il Tempo to be in agreement with the music which is performing animation scrolling. It is because it is more desirable to also change BGM by Il Tempo since a scroll rate changes and the difficulty of a performance as a shooting game changes by Il Tempo.

[0024] Furthermore, what is necessary is just to make it the colors of an apple differ in this example, corresponding to sound length so that a player may understand sound length, since the sound length of a note is unknown by having transformed the note into the apple.

[0025] Moreover, what is necessary is not to restrict to this, for example, to be an airplane, a bird, etc., and just to make it shoot down by the machine gun or the rifle gun in this case in this example, although the character was used as the apple.

[0026] The control processing which the musical amusement system constituted as mentioned above performs is hereafter explained with reference to drawing 4 -6.

[0027] Drawing 4 is a flow chart which shows the procedure of the main routine which CPU3 of the musical amusement system of this example performs.

[0028] In this drawing, initial setting, such as a clearance of RAM5 and a clearance of various ports, is performed first (step S1).

[0029] Next, the note information for a screen display is read from the performance data storage area secured to said RAM5, when the note is contained in the read note information, the pronunciation authorization range and the silence authorization range are determined for every note, and it memorizes to the predetermined field of RAM5 (step S2), and a note is displayed on a display 7 in the configuration of said apple (step S3). Here, the note information memorized in a performance data storage area is constituted by the event data in which the class of a pitch and this note etc. is shown, and the DEYURESHON data in which the time interval between these event data is shown, and the end data in which the last of performance data is shown are memorized by the last of note information.

[0030] Drawing 6 is drawing showing an example of the screen displayed on the display 7, (a) shows the screen before starting the performance of music, and (b) shows the screen when performing music. A figure shows the location of the data in a performance data storage area among drawing, in each drawing, the upper figure ("1000" "1395") shows the upper limit location of the note

information for a screen display, and the lower figure ("0" "395") shows the minimum location. Moreover, a straight line L2 is the "present performance location" explained by said drawing 3. Hereafter, with reference to this drawing 6, processing of each steps S2 and S3 is explained concretely.

[0031] If the range "30" is taken as said allowances range (it is more desirable to change this range according to the class of note) From the event data and DEYURESHON data which were read at step S2, for example the pronunciation authorization range a1 It is decided that it will be the range of 390-420, and the silence authorization range a2 is determined as the range of 590-620, a pitch is determined as "C6", and each of such information is memorized to the predetermined field secured to RAM5. And based on such information, the screen of (a) is displayed on a display 7.

[0032] It distinguishes whether the directions which start the performance of return and music to drawing 4 were made (step S4). What is necessary is just made to perform the directions which start the performance of music here by carrying out the depression of the start switch which the panel handler 2 does not illustrate.

[0033] By distinction of step S4, when directions of a start are made, it progresses to step S5, and on the other hand, it stands by until there are directions of a start, when directions of a start are not made.

[0034] At step S5, a timer interrupt is permitted so that timer interrupt processing of drawing 5 mentioned later may be performed, and in step S6, it distinguishes whether there was any key pushing event generated when a player does key pushing of the keyboard 1.

[0035] It distinguishes whether by distinction of step S6, when there is a key pushing event, it goes into pronunciation authorization within the limits which the generating timing of the key pushing event determined at said step S2, and the pitch is in agreement (step S7). Based on the pronunciation authorization range and pitch which were memorized to RAM5, it is made to perform this distinction at said step S2.

[0036] While stabbing a corresponding apple with an arrow by distinction of step S7 as mentioned above by performing pronunciation processing of the key pushing event concerned (step S8) when the answer is "YES", the score of the apple with which the arrow was stuck is calculated, and it adds and displays on the score till then (step S9).

[0037] By distinction of step S6, when there is no key pushing event, step S7 - S9 are skipped, it progresses to step S10, on the other hand, when the answer is "NO" in distinction of step S7, step S8 - S9 are skipped, and it progresses to step S10.

[0038] When it distinguishes whether there was any key-release event generated at step S10 when a player does key-release of the keyboard 1 and there is a key-release event, it distinguishes whether the generating timing of the key-release event goes into silence authorization within the limits which determined and memorized at said step S2, and the pitch is in agreement like said step S7 (step S11).

[0039] By distinction of step S11, when the answer is "YES", silence processing of the key-release event concerned is performed (step S12), and like said step S9, a score is calculated, and it adds and displays on the score till then (step S13).

[0040] By distinction of step S10, when there is no key-release event, steps S11-S13 are skipped, it progresses to step S14, on the other hand, when the answer is "NO" in distinction of step S11, steps S12 and S13 are skipped, and it progresses to step S14.

[0041] At step S14, the silence range is passed, the sound under pronunciation is muffled, and it distinguishes whether the directions which make the performance of music stop were made in step S15. When a player does the depression of the stop switch which the panel setting handler 2 does not illustrate, what is necessary is just made to perform directions of a stop here.

[0042] directions of a stop should do by distinction of step S15 -- when there is nothing, it returns to said step S6, and above-mentioned processing is repeated, when directions of a stop are made, after performing a post process on the other hand (step S16), it returns to said step S2, and above-mentioned processing is repeated.

[0043] Drawing 5 is a flow chart which shows the procedure of timer interrupt processing, and this interruption processing is made at 1 time of a rate for every time amount according to the die length of a predetermined note. That is, he interrupts according to Il Tempo and is trying to change timing.

In addition, you may make it generate interruption not only to this but to the timing of every predetermined time (for example, 10msec).

[0044] In this drawing, the current position is incremented first (step S21). Here, the location shown in the straight line L2 of said drawing 6 is said, and, as for the current position, only "1" increments this location at step S21.

[0045] Next, a read-out location is incremented (step S22). Here, the upper limit location of the note information for the screen display explained by said drawing 6 is said, and, as for a read-out location, only "1" increments this location at step S22.

[0046] Based on the location which incremented at steps S21 and S22, scrolling processing which performs animation scrolling which rewrote and mentioned the screen display of a display 7 above is performed (step S23), it is secured in the predetermined field of said RAM5, and only "1" subtracts the software counter TIME (henceforth the DEYURESHON time TIME") which stores said read DEYURESHON data (step S24).

[0047] Next, it distinguishes whether this DEYURESHON time TIME is "0" (step S25), this interruption processing is ended at the time of DEYURESHON time TIME!=0, and, on the other hand, note information is read at the time of DEYURESHON time TIME=0 (step S26).

[0048] And this read note information distinguishes whether it is "a note (namely, event data mentioned above)" (step S27). When it is a "note", apple-ize on a display 7 and it displays on it (step S28). Like step S2 of said drawing 4, based on a read-out location and a note class After determining the pronunciation authorization range and the silence authorization range, memorizing to the predetermined field of RAM5 (step S29) and only "1" advancing the read-out address (step S30), it returns to said step S26, and read-out of note information is repeated.

[0049] When it is DEYURESHON data, after, distinguishing whether the information is "DEYURESHON data" when the read note information is not a "note" by distinction of step S27 on the other hand (step S31), and memorizing the value in said DEYURESHON time TIME (step S32), this timer interrupt processing is ended.

[0050] On the other hand, by distinction of step S31, when the read note information is not DEYURESHON data, it distinguishes whether the data is "and data" (step S33).

[0051] By distinction of step S33, when the read data are not end data, this interruption processing is ended immediately, and on the other hand, when the read data are chlorine data, after performing a post process (step S34), this interruption processing is ended.

[0052] As explained above, in this example, read note information and animation scrolling is carried out. If key-release of the key by which key pushing is carried out is carried out when the musical sound concerned is pronounced and it comes to silence authorization within the limits, while the character will be shot down and a score will be added, if key pushing of the keyboard 1 is carried out when the character corresponding to a note comes to pronunciation authorization within the limits Since it constituted so that this thing this musical sound might be muffled as if a score is added, the beginner who cannot read a score can also enjoy himself easily and can play electrohone. Moreover, since it was made for a character to scroll in the location of the key which should be carried out key pushing while displaying the keyboard on the display 7, it is turned out which keyboard a player should just flip sensuously. Furthermore, since it becomes difficult as a shooting game when the music to perform is ****, a user's width of face is expandable not only to the user who is interested in electrohone but a game maniac.

[0053] In addition, in this example, although explained using an electronic keyboard instrument as electrohone, it is not necessary to restrict to this.

[0054] Moreover, as a musical amusement system, like drawing 1, although constituted in one apparatus containing all the components that carry out this invention, another object may constitute not only this but a component from this example. For example, the electrohone 21 which outputs a MIDI signal according to performance music as shown in drawing 7, The personal computer 22 which displays on a display like drawing 6, or outputs the MIDI signal which directs pronunciation/silence according to the processing which inputted the outputted this MIDI signal and was explained by said drawing 4 and 5, The outputted this MIDI signal is inputted and you may make it the sound source 23 and sound system 24 which actually perform pronunciation/silence of musical sound constitute a musical amusement system.

[0055] Furthermore, although the screen top was scrolled from a top to the bottom in this example as shown in said drawing 2 (c), depth perception is given and you may make it a note (character) approach gradually, as shown not only in this but in drawing 8.

[0056] In addition, in this example, when the music to perform is too difficult for a player since interruption processing is performed the interrupt period according to Il Tempo as mentioned above using drawing 5, it is good to set up Il Tempo late. If Il Tempo is made late, since it becomes easy naturally as a game, it is necessary to change the wait when adding a score according to Il Tempo. By doing in this way, a player can flip, when any **** make Il Tempo late. However, since "the temper which was able to be flipped" cannot be experienced in a performance far later than Il Tempo of normal even if it is able to flip to the last, when such, it is good to pass BGM unrelated to performance music, as mentioned above. And on the level, if it is made to perform pronunciation / silence processing when Il Tempo is raised and it becomes Il Tempo of normal as it comes to burst gradually, since it bursts to some extent, the feelings of "having burst" can be obtained. Moreover, performance music has a performance of other musical instruments, for example, if the performance of orchestra is added with pronunciation / silence processing in the case of a piano concerto etc., presence will become good further.

[0057] Moreover, level is prepared in the pronunciation authorization range and the silence authorization range, respectively, and when near, you may make it an event add more scores by the timing of normal.

[0058] Drawing 9 is a flow chart which shows the procedure of the control processing which the musical amusement system of this example performs, when the function which changed the score etc. according to above-mentioned Il Tempo is added.

[0059] this drawing -- setting -- first -- directions of an operator -- or difficulty or Il Tempo is chosen automatically (step S41). It is because it is shown that you may make it change Il Tempo of music, and may make it change Il Tempo of direct music by specifying difficulty here, since having considered as "difficulty or Il Tempo" has the relation that Il Tempo will become quick if relation with usually same difficulty and Il Tempo, i.e., difficulty, goes up, and Il Tempo will become late if difficulty falls. Moreover, "difficulty" corresponds to "fields" and "stages", such as a game, and Il Tempo, said pronunciation authorization range, and the silence authorization range change with these difficulty.

[0060] Next, after starting the performance of performance music (step S42), carrying out by choosing either among pronunciation control, BGM playback, or accompaniment playback according to difficulty (Il Tempo) (step S43) and adding the score according to difficulty (Il Tempo) (step S44), the performance of performance music is ended (step S45). Here, specifically, processing of steps S42-S45 is realized by processing of said drawing 4, and the same processing. In addition, a player may be made to choose selection of step S43 by manual actuation.

[0061] Next, a score judgment which compares success Rhine and rejection Rhine in the gained score and its difficulty is made (step S46), the difficulty (Il Tempo) in the next stage is changed according to this decision result (step S47), and it distinguishes whether it is beyond a predetermined score (step S48).

[0062] By distinction of step S48, when the gained score is beyond a predetermined score (i.e., when music is able to be performed), while ending this control processing, when there are few gained scores than a predetermined score, it returns to said step S42, and the above-mentioned processing is repeated. Therefore, when this control processing is able to be ended, Il Tempo must be Il Tempo of normal. Conversely, what is necessary is just to decide the mark which should be gained so that it may not become beyond a predetermined score, before being able to perform by Il Tempo of normal, if it says.

[0063] Thus, when the optimal music can be practiced according to difficulty (or game) and it practices continuously by adding this function, it can avoid boring a player.

[0064]

[Effect of the Invention] Since score information will be displayed on a lengthwise direction according to the performance data memorized by the performance data storage means and the displayed score information will be scrolled in the direction predetermined by Il Tempo according to said performance data if it depends on this invention as explained above, the effectiveness it is

ineffective to being able for the beginner who cannot read a score to also enjoy himself simply and to play electrohone is done so.

[0065] Moreover, if performance information being pronunciation authorization within the limits given to the note of the scrolled score information, and having been inputted is detected, since predetermined control processing will be performed by the control processing means, he can also enjoy himself as a game while turning out how a player should just input performance information sensuously.

[Translation done.]

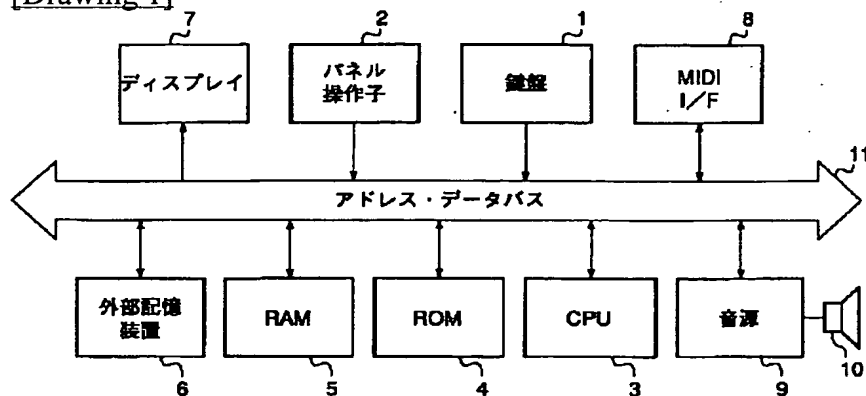
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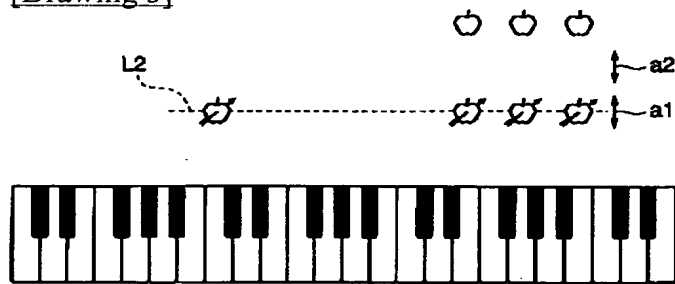
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DRAWINGS

[Drawing 1]

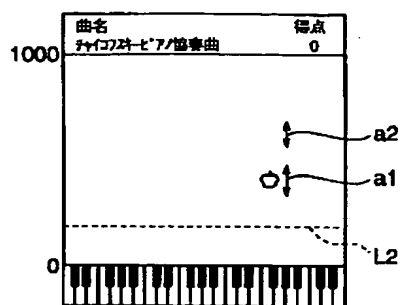


[Drawing 3]

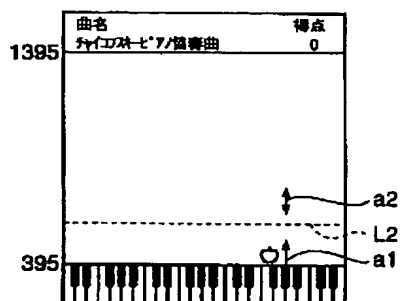


[Drawing 6]

(a)



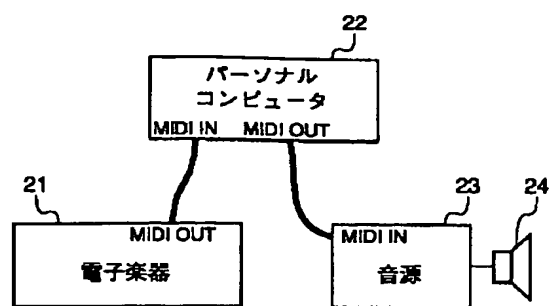
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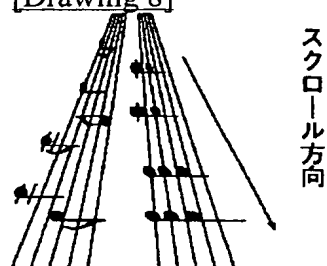
[Drawing 2]

(a)

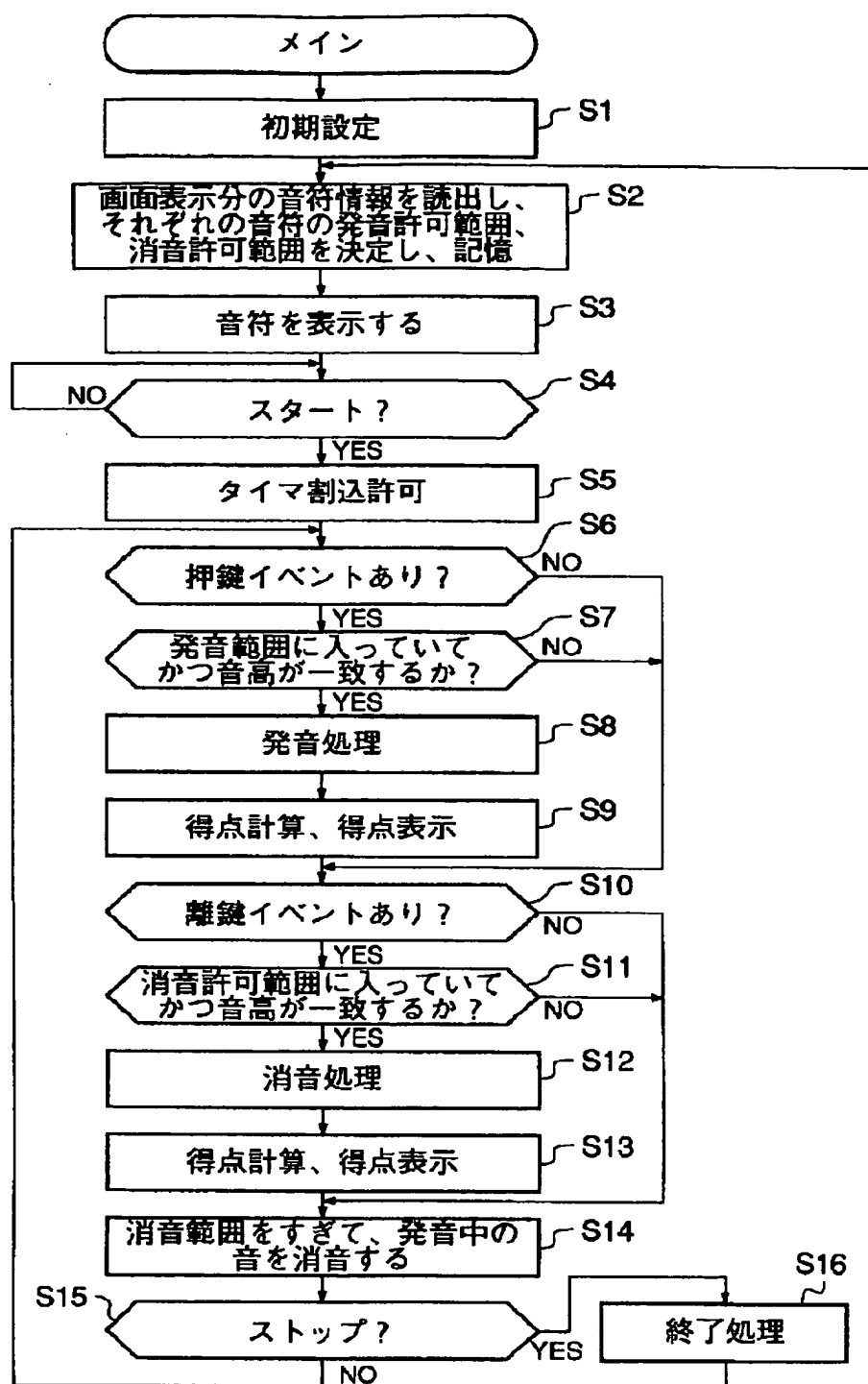




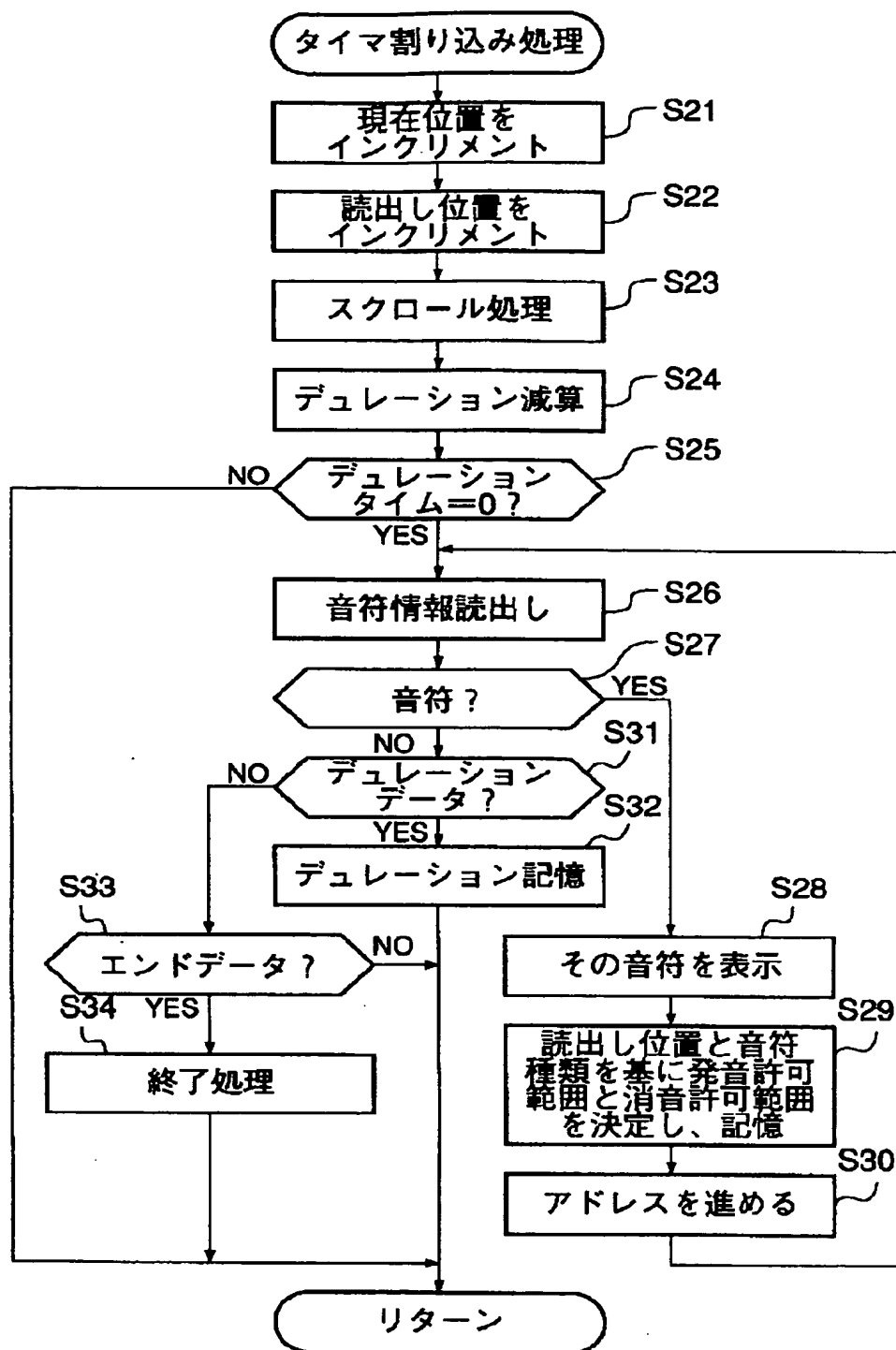
[Drawing 8]



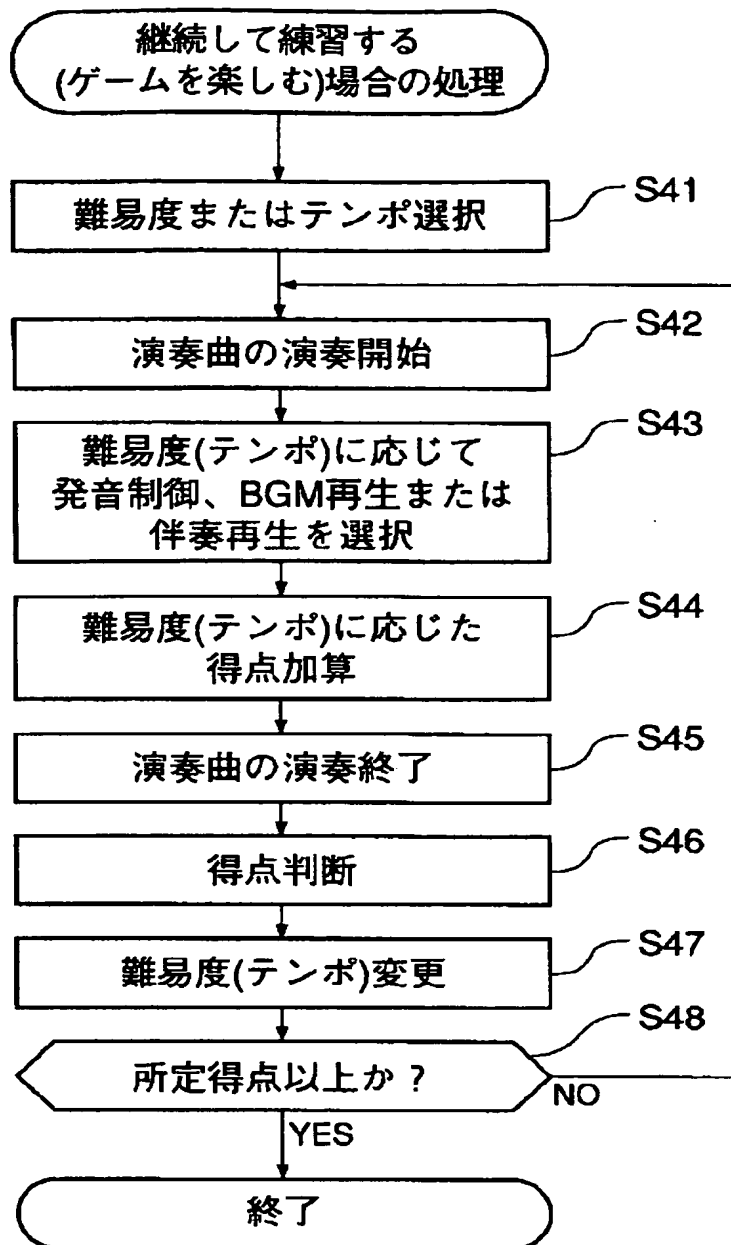
[Drawing 4]



[Drawing 5]



[Drawing 9]



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CORRECTION OR AMENDMENT

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Z

G10G 1/00

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[Document to be Amended] Specification

[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] The musical amusement system characterized by having a performance data storage means to memorize performance data, a display means to display score information on a lengthwise direction according to the this memorized performance data, and a scrolling means to scroll the this displayed score information in the direction predetermined by Il Tempo according to said performance data.

[Claim 2] It is the musical amusement system according to claim 1 characterized by having a difficulty setting means for setting up difficulty, and for said scrolling means changing said Il Tempo according to the this set-up difficulty, and scrolling by Il Tempo after this modification.

[Claim 3] A musical amusement system given in either of claims 1 or 2 which is characterized by providing the following. A performance information input means for a player to input performance information An authorization range grant means to give the predetermined range which should carry out pronunciation authorization for every note of said displayed score information A detection means to be said pronunciation authorization within the limits by which the note of said scrolled score information was given to this note, and to detect that the performance information on the pitch corresponding to the note concerned was inputted from said performance information input means A

control processing means to perform predetermined control processing when the performance information on the pitch corresponding to the note concerned being said pronunciation authorization within the limits, and having been inputted by this detection means is detected

[Claim 4] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 3 characterized by being pronunciation processing according to the note concerned.

[Claim 5] It is the musical amusement system according to claim 4 carry out said performance data-storage means memorizing performance data other than the performance data displayed on said display means, and carrying out by said control processing means choosing the pronunciation processing according to performance data other than the performance data displayed on the pronunciation processing according to said note, and said display means according to the difficulty arbitrarily set up by said difficulty setting means as the description.

[Claim 6] Said authorization range grant means gives said displayed predetermined range which should carry out silence authorization for every note. Said detection means It is given silence this authorization within the limits, and detects that the input of the performance information on the pitch corresponding to the note concerned was suspended from said performance information input means. Said control processing means The musical amusement system according to claim 3 characterized by performing predetermined control processing when the input of the performance information on the pitch corresponding to the note concerned is said silence authorization within the limits and is suspended by this detection means.

[Claim 7] Said authorization range grant means is a musical amusement system according to claim 6 characterized by changing and giving either [at least] the pronunciation authorization range or the silence authorization range according to said difficulty setting means.

[Claim 8] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 7 characterized by being the pronunciation according to the note concerned, or silence processing.

[Claim 9] The predetermined control processing which said control processing means performs is a musical amusement system according to claim 1 to 8 characterized by being addition of the score according to a note or Il Tempo concerned.

[Claim 10] A line display means to display the line which shows the timing which should operate said handler in the character display means which is characterized by providing the following and which indicates the character by scrolling by predetermined Il Tempo in a lengthwise direction, the handler operated by the operator, and said scrolling direction and the direction which goes direct Said character is scrolled toward this line. A grading means to grade according to whether the timing by which said handler was operated, and the timing to which said scrolled character reached said line were in agreement

[Claim 11] Said handler is a musical amusement system according to claim 10 characterized by consisting of two or more handlers and said character consisting of two or more kinds of characters corresponding to the number of said two or more handlers.

[Claim 12] The musical amusement system given in claim 11 <U> characterized by making each of two or more of said handlers, and said display showing two or more correspondence relation with the character of a class while expressing the appearance-configuration of two or more of said handlers, or arrangement near said line.

[Claim 13] judging with coincidence, when the timing authorization range was set up near said character, and, as for said grading means, said handler is operated while this timing authorization range was coming to said line -- the musical amusement system according to claim 10 characterized by things.

[Claim 14] The musical amusement system according to claim 13 characterized by setting up level to said timing authorization range, and changing a grading result according to this level.

[Claim 15] It is the musical amusement system according to claim 10 which said predetermined Il Tempo which scrolls said character can be changed, and is characterized by said grading means changing a grading result according to this changed Il Tempo.

[Claim 16] Furthermore, the musical amusement system of the claim proposal 1 publication characterized by passing BGM of this Il Tempo with scrolling of said character according to said predetermined Il Tempo.

[Procedure amendment 2]
 [Document to be Amended] Specification
 [Item(s) to be Amended] 0011
 [Method of Amendment] Modification
 [Proposed Amendment]

[0011] Furthermore, predetermined control processing which said control processing means performs is preferably characterized by being addition of the score according to a note or Il Tempo concerned. moreover, in the 2nd invention other than the above-mentioned invention for the above-mentioned purpose The character display means which indicates the character showing the note of predetermined music by scrolling by predetermined Il Tempo in a lengthwise direction, The thing which is a line display means to display the line which shows the timing which should operate said handler in the handler operated by the operator, and said scrolling direction and the direction which goes direct and by which said character is scrolled toward this line, It is characterized by having a grading means to grade according to whether the timing by which said handler was operated, and the timing to which said scrolled character reached said line were in agreement. It is characterized by for said handler consisting of two or more handlers, and the character showing said note consisting of a character showing two or more kinds of notes corresponding to the number of said two or more handlers in the 2nd invention, preferably. Moreover, preferably, while expressing the appearance-configuration of two or more of said handlers, or arrangement near said line in the 2nd invention, it is characterized by making the display showing the correspondence relation between each of two or more of said handlers, and said character showing two or more notes of a class. moreover, the thing preferably judged in the 2nd invention to be coincidence when the timing authorization range was set up near said note, and, as for said grading means, said handler is operated while this timing authorization range was coming to said line -- it is characterized by things. Furthermore, preferably, level is set up to said timing authorization range, and it is characterized by changing a grading result according to this level. Moreover, in the 2nd invention, said predetermined Il Tempo which scrolls said character can be changed preferably, and said grading means is characterized by changing a grading result according to this changed Il Tempo. It is characterized by passing BGM of this Il Tempo with scrolling of said character according to said predetermined Il Tempo still more preferably.

[Procedure amendment 3]
 [Document to be Amended] Specification
 [Item(s) to be Amended] 0013
 [Method of Amendment] Modification
 [Proposed Amendment]

[0013] Moreover, detection of being ***** authorization within the limits given to the note of the score information by which performance information was scrolled, and having been inputted performs predetermined control processing with a control processing means. On the other hand, in the 2nd invention, it grades according to whether the timing by which the handler was operated, and the timing to which the character which scrolls reached the line were in agreement.

[Procedure amendment 4]
 [Document to be Amended] Specification
 [Item(s) to be Amended] 0065
 [Method of Amendment] Modification
 [Proposed Amendment]

[0065] Moreover, if being pronunciation authorization within the limits given to the note of the score information by which performance information was scrolled, and having been inputted is detected, since predetermined control processing will be performed by the control processing means, he can enjoy himself as a game while turning out how a player should just input performance information sensuously. Moreover, in the 2nd invention, since it is graded according to whether the timing which operated the handler, and the timing which reached the line by which the character which scrolls is displayed were in agreement, an operator knows whether an input is how much possible to right timing. Moreover, it can be operated with the feeling near what has two or more performance control units, such as a keyboard instrument, by making it operate it by two or more handlers, using a character as two or more kinds. Moreover, the decision result of having suited the level of the player

here can be obtained by making it change a grading result according to level. Furthermore, it can judge whether variegated timing was in agreement because whether modification of Il Tempo was enabled, the character was scrolled by desired Il Tempo, and timing was in agreement judges. Furthermore, according to Il Tempo which scrolls decision, it can judge whether timing was more in agreement like the performance by passing BGM.

[Translation done.]